

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

BIRD, William, E.
Bird Goën & Co.
Vilvoordsebaan 92
B-3020 Winksele
BELGIQUE

Date of mailing (day/month/year) 09 March 2001 (09.03.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference N1588-PCT	
International application No. PCT/IB00/01410	International filing date (day/month/year) 20 September 2000 (20.09.00)

1. The following indications appeared on record concerning:

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

Name and Address NORTEL MATRA CELLULAR 1, place des Frères Montgolfier F-78928 Guyancourt Cedex 9 France	State of Nationality FR	State of Residence FR
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person ☒ the name ☒ the address ☒ the nationality ☒ the residence

Name and Address NORTEL NETWORKS LIMITED World Trade Center Of Montreal 380 St. Antoine Street West 8th Floor Montreal, Québec H2Y 3Y4 Canada	State of Nationality CA	State of Residence CA
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input checked="" type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input type="checkbox"/> the elected Offices concerned
<input type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer I. Britel Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

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NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

BIRD, William, E.
Bird Goën & Co.
Vilvoordsebaan 92
B-3020 Winksele
BELGIQUEDate of mailing (day/month/year)
03 December 2001 (03.12.01)Applicant's or agent's file reference
N1588-PCTInternational application No.
PCT/IB00/01410

IMPORTANT NOTIFICATION

International filing date (day/month/year)
20 September 2000 (20.09.00)

1. The following indications appeared on record concerning:

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

Name and Address

NORTEL NETWORKS LIMITED
World Trade Center Of Montreal
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8th Floor
Montreal, Québec H2Y 3Y4
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CAState of Residence
CA

Telephone No.

Facsimile No.

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☐ the name ☒ the address ☐ the nationality ☐ the residence

Name and Address

NORTEL NETWORKS LIMITED
2351 Boulevard Alfred-Nobel
St. Laurent, Quebec H4S 2A9
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CA

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Teleprinter No.

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

☒ the receiving Office ☐ the designated Offices concerned
☐ the International Searching Authority ☒ the elected Offices concerned
☒ the International Preliminary Examining Authority ☐ other:The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Anman QIU

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 12 July 2001 (12.07.01)	
International application No. PCT/IB00/01410	Applicant's or agent's file reference N1588-PCT
International filing date (day/month/year) 20 September 2000 (20.09.00)	Priority date (day/month/year) 20 September 1999 (20.09.99)
Applicant LUCIDARME, Thierry et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
29 March 2001 (29.03.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Pascal Piriou Telephone No.: (41-22) 338.83.38
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REC'D 24 JAN 2002

WIPO PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference N1588-PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IB00/01410	International filing date (day/month/year) 20/09/2000	Priority date (day/month/year) 20/09/1999
International Patent Classification (IPC) or national classification and IPC H04Q7/26		
Applicant AIB [NORTEL MATRA CELLULAR et al.] NORTEL NETWORKS LIMITED A		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 9 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 7 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 29/03/2001	Date of completion of this report 21.01.2002
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Ceccarini, G Telephone No. +49 89 2399 2997 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IB00/01410

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):
Description, pages:

1-29 as originally filed

Claims, No.:

1-33 as received on 14/12/2001 with letter of 14/12/2001

Drawings, sheets:

1/17-17/17 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
4. The amendments have resulted in the cancelation of:
- ☐ the description, pages:
- ☐ the claims, Nos.:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB00/01410

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
☐ paid additional fees.
☐ paid additional fees under protest.
☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☐ all parts.
☒ the parts relating to claims Nos. 1-24,27-30.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-24,27-30
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-24,27-30

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IB00/01410

Industrial applicability (IA) Yes: Claims 1-24,27-30
 No: Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Concerning Section IV:

- 1 Reference is made to the following document:

D1: EP-A-0 766 427 (NOKIA MOBILE PHONES LTD.) 2 April 1997 (1997-04-02)
cited in the application.

It is considered that the present application lacks unity and hence does not comply with the requirements of unity of invention as set forth in Rule 13 PCT. Indeed, it is considered that three separate inventions are claimed in the present application, without there being any unifying inventive concept common to both:

a. Claims 1 to 24, 27 to 30 relate to a mobile radio network (and methods thereof) which comprises radio heads and a concentrator connected to the radio heads by a local shared resource network.

b. Claims 25 and 26 relate to a concentrator for connection to a mobile network being used as a resource on a local shared resource network.

c. Claims 31 to 33 relate to a radio head for use as a shared resource on a local shared resource network.

- 3 They are not so linked as to form a single general inventive concept (Rule 13.1).

Indeed, since the only technical relationship among the claimed inventions is the use of a local shared resource network, which is already known from D1 (see Abstract; Fig.2), the three sets of claims do not have a general inventive concept (Rule 13.2 PCT) and, thus the application lacks unity.

- 4 As a full preliminary search report has been established with respect to all claims on file a full preliminary examination could also be conducted, providing that additional preliminary examination fees were paid, Article 34(3)(a), Rule 68(2) PCT).

- 5 Since neither restriction of the claims has been done, nor additional preliminary examination fees has been paid, preliminary examination has been carried out on the basis of those parts of the application which relate to what appears to be the main invention, namely the invention as defined in present **Claims 1-24, 27-30**.

Concerning Section V:

- 1 Document **D1** (see in particular Abstract; Fig. 2; pag. 9, lines 27-33) discloses, according to features of **Claim 1**, a first local mobile radio telecommunications network (LAN in Fig. 2; page 5, lines 10 to 15) which is connectable to and compatible with a second mobile radio telecommunications network (pag. 3, lines 40-46; Abstract; Fig. 2; cellular radio system pag. 4, lines 32-36), the first local network comprising:
- a first and a second radio head for radio communication with one or more user terminals compatible with the second mobile radio telecommunications network (BU 4 in Fig. 2; pag. 5, lines 23-28; the base units are provided with a limited number of functions pag. 5, lines 16-22);
 - a gateway connected to the radio heads by a local shared resource network (Gateway 1 e LAN in Fig. 2; pag. 6, lines 37-39) the radio heads being shared resources of the gateway (Fig. 2; pag. 5, lines 29- 33).

The subject-matter of Claim 1 differs from that disclosed in D1 only in that the a gateway is used instead of a concentrator and that the synchronization and frequency of a local timing signal of each of the first and second radio heads are being controlled individually and remotely.

However, the gateway in D1 is used with same functions of the concentrator (see for instance D1 pag. 3, lines 30-46; pag.3 line 58 to pag. 4 line 1; pag. 6, lines 22-28) and the timing control represents standard practice for a person skilled in the art LAN synchronization, GSM specification and BTS' clock (see "The GSM system for mobile communications", by M. Mouly and M-B Pautet, Cell & Cys, 1992, pagg. 620-623, as acknowledged by the applicant on page 2).

The subject-matter of Claim 1 does therefore not involve an inventive step (Article 33(3) PCT).

- 2 The subject-matter of independent **Claim 4** differs from that disclosed in Claim 1 only in that a plurality of radio heads are being used and the concentrator includes at least a digital signal processing unit (DSP).

However, D1 also encompasses the use of more than one radio heads (base units pag. 5, line 10) and the use of DSP is a standard practice for elaborating signal in that kind of network.

The subject-matter of Claim 4 does therefore not involve an inventive step (Article 33(3) PCT).

- 3 Independent **Claims 14, 16** contain only features already set out in Claims 1 and 3 respectively, in terms of a method claims.

The subject-matter of Claims 14 and 16 does therefore not involve an inventive step (Article 33(3) PCT).

- 4 The subject-matter of independent **Claim 27** differs from that disclosed in Claim 1 only in that a scanning unit is used in order to scan transmissions from sources of radio energy, the scanning unit being a shared resource on the local shared resource network.

However, it is already disclosed in D1 that the RF part of the base head (base unit 4 in Fig. 4 which belongs to the common LAN resource) is used for measuring radio signals (pag. 7, lines 20-24; for complying with different load requirements pag.7, lines 18-20) and therefore these features are simple modification directly derivable from D1 and thus fall within the normal design choice for a person skilled in the art.

The subject-matter of independent **Claim 28** differs from that disclosed in Claim 1 only in that the first network is adapted to select the signals from one of the radio heads.

However, this is a simple variation of the arrangement disclosed and in the fields of LAN and shared resources (see also D1, page 8; lines 52-57) falls within the general design competence of a skilled person.

The same applies also to independent **Claim 30** where the selection is being made by the concentrator (see also D1, pag. 6, lines 37-39; pag. 3, line 57 to pag. 4, line 1; page 8; lines 52-57).

The subject-matter of Claims 27, 28 and 30 does therefore not involve an inventive step (Article 33(3) PCT).

- 5 The features defined in dependent **Claims 2, 3, 5 to 13, 15, 17 to 24, 29** do not add anything of inventive significance to the claims they refer because they relate to minor constructional circuit details and are either directly derivable from the above-mentioned prior art documents D1, or represents standard practice.

Concerning Section VII:

- 1 Reference signs in parentheses should have been inserted in the claims to increase their intelligibility, Rule 6.2(b) PCT. This applies to both the preamble and characterising portion.
- 2 To meet the requirements of Rule 6.3(b) PCT any independent claim should have been properly cast in the two-part form, with those features which in combination are part of the nearest prior art document D1 being placed in the preamble.

Concerning Section VIII:

- 1 Some of the features in the method Claim 14 relate to an apparatus ("a concentrator ...") rather than clearly defining the method in terms of technical steps. The intended limitations are therefore not clear from this claim, contrary to the requirements of Article 6 PCT.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IB00/01410

- 2 The various definitions of the invention given in independent apparatus Claims 1, 4 and 27, 28 and 30 and method Claims 14 and 16 of overlapping scope are such that the claims as a whole are not concise, contrary to Article 6 PCT. The claims should have been recast to include only the minimum necessary number of independent claims in any one category, with dependent claims as appropriate (Rule 6.4 PCT).
- 3 The general statement in the description at page 29, line 26, is not clear, and when used to interpret the claims renders them also unclear, contrary to Article 6 PCT. The term "and the spirit" should therefore be deleted.

**REPLACED BY
ART 34 AMDT**

Claims

30

1. A first local mobile radio telecommunications network which is connectable to and compatible with a second mobile radio telecommunications network, the first local
5 network comprising: a first and a second radio head for radio communication with one or more user terminals compatible with the second mobile radio telecommunications network; a concentrator connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator; the synchronization and frequency of a local timing signal of each of the first and second radio heads being
10 controlled individually and remotely.
2. The first local mobile radio telecommunications network according to claim 1, wherein the concentrator performs the remote control.
- 15 3. A first local mobile radio telecommunications network which is connectable to and compatible with a second mobile radio telecommunications network, the first local network comprising:
a plurality of radio heads for radio communication with one or more user terminals compatible with the second mobile telecommunications network;
20 a concentrator connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator; and the concentrator including at least a digital signal processing unit, the digital signal processing unit being a shared resource for the radio heads.
- 25 4. The first local mobile radio telecommunications network according to claim 2 or 3 wherein, the concentrator includes at least one of:
a channel coder for channel coding messages to be transmitted from one or more of the radio heads, the channel coder being a shared resource for the one or more radio heads; a channel decoder, the channel decoder being a shared resource for the one or
30 more radio heads;
an equalizer, the equalizer being a shared resource for the one or more radio heads; a demodulator for demodulating radio samples from the one or more radio heads, the demodulator being a shared resource for the one or more radio heads,

a modulator, the modulator being a shared resource for the one or more radio heads;

a digital filter, the digital filter being a shared resource for the one or more radio heads;

5 an encrypter, the encrypter being a shared resource for the one or more radio heads; a decrypter, the decrypter being a shared resource for the one or more radio heads.

10 5. The first local mobile radio telecommunications network according to any of claims 1 to 4, further comprising a scanning unit to scan transmissions from sources of radio energy, the scanning unit being a shared resource on the local shared resource network.

15 6. The first local mobile radio telecommunications network according to any of claims 1 to 5, wherein each of one or more of the radio heads includes at least two fixed gain receiver amplifiers and a unit for selecting the output of one of the amplifiers.

7. The first local mobile radio telecommunications network according to claim 6, wherein the selection unit is adapted to select none of the outputs of the amplifiers.

20 8. The first local mobile radio telecommunications network according to any of claims 2 to 7, wherein each of one or more of the radio heads include at least two receivers and each one or more radio head is adapted to transmit the two received radio signals from the two receivers to the concentrator via the local shared resource network and the concentrator includes a selector circuit to select one of the two signals for digital signal
25 processing.

9. The first local mobile radio telecommunications network according to any of claims 2 to 8, wherein two or more radio heads are adapted to receive signals transmitted from a user terminal and the concentrator is adapted to combine the signals from the two or
30 more radio heads before digital signal processing the combined signals.

10. The first local mobile radio telecommunications network according to any of claims 2 to 8, wherein two or more radio heads are adapted to receive signals transmitted from

a user terminal and to transmit these to the concentrator via the local shared resource network and the concentrator is adapted to select the signals from one of the radio heads.

11. The first local mobile radio telecommunications network according to claim 10,
5 wherein the first network is adapted to prevent the received signals of the not-selected radio heads from being transmitted through the local shared resource network.

12. The first local mobile radio telecommunications network according to any of claims
1 to 11, the first network being adapted to transmit a beacon signal from two or more
10 radio heads, each signal being transmitted with a selectable delay.

13. A method of operating a first local radio telecommunications network which is
connected to and compatible with a second mobile radio telecommunications network,
comprising the steps of: transmitting radio signals from a first and a second radio head
15 to one or more user terminals compatible with the second mobile radio
telecommunications network, a concentrator being connected to the local shared
resource network, the concentrator and the radio heads being shared resources of a local
shared resources network; and remotely controlling the frequency and synchronization
of a local timing signal of each of the first and second radio heads individually.

20

14. The method according to claim 13 wherein the remote control step is performed by
the concentrator.

15. A method of operating a first local mobile radio telecommunications network which
25 is connected to and compatible with a second mobile radio telecommunications network,
comprising the steps of:

receiving first mobile radio telecommunication signals from one or more user terminals
compatible with the second mobile radio telecommunications network at one or more
radio heads, the first radio mobile radio telecommunication signals encoding user
30 messages;

transmitting second radio signals derived from the first radio mobile telecommunication
signals over a local shared resource network to a concentrator; and
digital signal processing the second radio signals in the concentrator.

16. The method according to claim 14 or 15, further comprising at least one of the following steps in the concentrator:

- demodulating radio samples received from the one or more radio heads;
- 5 modulating radio samples to be transmitted to one or more radio heads;
- channel decoding of radio samples received from the one or more radio heads;
- channel coding of messages to be transmitted from one or more of the radio heads;
- filtering of digital signals to or from the one or more radio heads;
- encryption or decryption of digital signals to or from the one or more radio heads;
- 10 channel equalization of digital signal to or from the one or more radio heads.

17. The method according to claims 13 or 16, further comprising the step of scanning transmissions from sources of radio energy.

- 15 18. The method according to any of claims 13 to 17, wherein each of one or more of the radio heads includes at least two fixed gain receiver amplifiers, further comprising the step of selecting the output from one the amplifiers.

- 19. The method according to claim 18, further comprising the step of preventing any of
20 the outputs from the amplifiers being transmitted over the local shared resource network.

- 20. The method according to any of claims 13 to 18, wherein two or more radio heads are adapted to receive signals transmitted from a user terminal, further comprising the step of combining the signals from the two or more radio heads before digital signal
25 processing the combined signals.

- 21. The method according to any of claims 14 to 20, wherein two or more radio heads are adapted to receive signals transmitted from a user terminal, further comprising the steps of: transmitting the received signals over the local shared resource network to the
30 concentrator and selecting the signals from one of the radio heads in the concentrator for digital signal processing.

- 22. The method according to claim 21, further comprising the step of preventing the

received signals of the not-selected radio head from being transmitted through the local shared resource network.

23. The method according to any of claims 13 to 22, further comprising the steps of
5 transmitting a beacon signal from two or more radio heads, each signal being transmitted with a selectable delay.

24. A concentrator for connection on one side to a mobile radio telecommunications network and for connection on another side for use as a shared resource on a local
10 shared resource network having a plurality of radio heads as shared network components; the concentrator comprising: an interface to the local shared resource network; and the concentrator being adapted to control remotely and for each individual radio head both synchronization and frequency of a local timing signal required for the operation of the radio heads.

15

25. A concentrator for connection on one side to a mobile radio telecommunications network and for connection on another side for use as a shared resource on a local shared resource network; the concentrator comprising:

an interface to the local shared resource network;

- 20 digital signal processing units for processing for transmitting outgoing radio signals to the interface for transmission to a radio transmitter the digital signal processing units being shared resources of the local shared resource network.

26. A first local radio telecommunications network which is connectable to and
25 compatible with a second mobile radio telecommunications network, the first local network comprising: a plurality of radio heads for radio communication with one or more user terminals compatible with the second mobile radio telecommunications network; a concentrator connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator; and a scanning unit to scan
30 transmissions from sources of radio energy, the scanning unit being a shared resource on the local shared resource network.

27. A first local mobile radio telecommunications network which is connectable to and

compatible with a second mobile radio telecommunications network, the first local network comprising: a plurality of radio heads for radio communication with two or more user terminals compatible with the second mobile radio telecommunications network;

- 5 a concentrator connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator; the two or more radio heads being adapted to receive signals from a user terminal and the first network is adapted to select the signals from one of the radio heads for transmission over the local shared resource network.

10

28. The first local network according to claim 27, wherein each of the radio heads includes at least two fixed gain receiver amplifiers and a unit for selecting the output of one of the amplifiers or none of the outputs of the amplifiers.

- 15 29. A first local mobile radio telecommunications network which is connectable to and compatible with a second mobile radio telecommunications network, the first local network comprising: a plurality of radio heads for radio communication with a user terminal compatible with the second mobile radio telecommunications network and for transmitting a plurality of radio signals received each received from the same user
20 terminal to the concentrator, the concentrator being connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator, and the concentrator being adapted to select one or a limited number of the radio signals from the plurality of radio signals from one user terminal for digital signal processing.

25

30. A radio head for connection on one side for use as a shared resource on a local shared resource network and on another side for communicating with user terminals of a mobile radio telecommunications network via an air interface; the radio head comprising: a network interface to the local shared resource network; and a unit for
30 transmitting to the network interface non-demodulated radio signals received from the user terminals.

31. A radio head for connection on one side for use as a shared resource on a local

shared resource network and on another side for communicating with user terminals of a mobile radio telecommunications network via an air interface; the radio head comprising:

a network interface to the local shared resource network; and

- 5 a first unit for receiving channel coded radio signals from the network interface; and
a second unit for modulating the received channel coded signals.

32. A radio head for connection on one side for use as a shared resource on a local shared resource network and on another side for communicating with user terminals of a radio telecommunications network via an air interface; the radio head comprising: an
10 interface to the local shared resource network; a synchronizing unit for receiving signals from the local shared resource network for remote control of the synchronization and frequency of a local timing signal required for the operation of the radio head.

INTERNATIONAL SEARCH REPORT

Inte Application No

PCT/IB 00/01410

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04Q7/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q H04L H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 766 427 A (NOKIA MOBILE PHONES LTD.) 2 April 1997 (1997-04-02) cited in the application abstract; figure 2 page 9, line 27 - line 33 *Idem*	3,15,25
A		1,13,24, 29,32
Y	GB 2 320 647 A (MOTOROLA LTD.) 24 June 1998 (1998-06-24) cited in the application figures 1,2 page 2, line 35 -page 3, line 14 *Idem*	3,15,25
A		1,13,24, 29,32
	— —/—	

X Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T"** later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X"** document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y"** document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&"** document member of the same patent family

Date of the actual completion of the international search

9 November 2000

Date of mailing of the international search report

20/11/2000

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Danielidis, S

INTERNATIONAL SEARCH REPORT

Int. Application No.

PCT/IB 00/01410

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 308 041 A (MOTOROLA LTD.) 11 June 1997 (1997-06-11) cited in the application abstract; figure 4 page 7, line 23 -page 8, line 7	3,4,28
A	WO 99 09769 A (INTERWAVE COMMUNICATIONS, INC.) 25 February 1999 (1999-02-25) abstract; figures 3-5, 7A-7C page 9, line 5 -page 11, line 17 page 19, line 18 -page 20, line 21	3,4,16, 28

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int. Application No

PCT/IB 00/01410

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 766427 A	02-04-1997	FI 954638 A JP 9135479 A US 5949775 A	30-03-1997 20-05-1997 07-09-1999
GB 2320647 A	24-06-1998	NONE	
GB 2308041 A	11-06-1997	AU 716171 B AU 7623696 A BR 9612774 A WO 9721316 A EP 0865710 A	17-02-2000 27-06-1997 24-10-2000 12-06-1997 23-09-1998
WO 9909769 A	25-02-1999	US 6101400 A AU 8909298 A EP 1005766 A	08-08-2000 08-03-1999 07-06-2000

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference N1588-PCT	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/IB 00/ 01410	International filing date (day/month/year) 20/09/2000	(Earliest) Priority Date (day/month/year) 20/09/1999
Applicant NORTEL MATRA CELLULAR et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

2
☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PC 00/01410

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q H04L H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 766 427 A (NOKIA MOBILE PHONES LTD.) 2 April 1997 (1997-04-02) cited in the application abstract; figure 2 page 9, line 27 - line 33	3, 15, 25
A	*Idem*	1, 13, 24, 29, 32
Y	GB 2 320 647 A (MOTOROLA LTD.) 24 June 1998 (1998-06-24) cited in the application figures 1, 2 page 2, line 35 - page 3, line 14	3, 15, 25
A	*Idem*	1, 13, 24, 29, 32
	--- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

9 November 2000

Date of mailing of the international search report

20/11/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
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Fax: (+31-70) 340-3016

Authorized officer

Danielidis, S

INTERNATIONAL SEARCH REPORT

International Application No

PCT 00/01410

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 308 041 A (MOTOROLA LTD.) 11 June 1997 (1997-06-11) cited in the application abstract; figure 4 page 7, line 23 -page 8, line 7 ----	3,4,28
A	WO 99 09769 A (INTERWAVE COMMUNICATIONS, INC.) 25 February 1999 (1999-02-25) abstract; figures 3-5, 7A-7C page 9, line 5 -page 11, line 17 page 19, line 18 -page 20, line 21 -----	3,4,16, 28

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT 00/01410

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 766427	A	02-04-1997	FI 954638 A JP 9135479 A US 5949775 A	30-03-1997 20-05-1997 07-09-1999
GB 2320647	A	24-06-1998	NONE	
GB 2308041	A	11-06-1997	AU 716171 B AU 7623696 A BR 9612774 A WO 9721316 A EP 0865710 A	17-02-2000 27-06-1997 24-10-2000 12-06-1997 23-09-1998
WO 9909769	A	25-02-1999	US 6101400 A AU 8909298 A EP 1005766 A	08-08-2000 08-03-1999 07-06-2000

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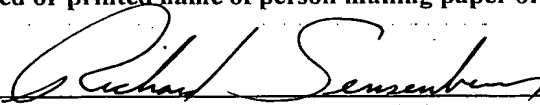
EL 874 025 148 US

Date of deposit: March 20, 2002

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington DC 20231

Richard Sensenbrenner

(Typed or printed name of person mailing paper or fee)

A handwritten signature in cursive script, appearing to read "Richard Sensenbrenner", is written over a horizontal line.

(Signature of person mailing paper or fee)

PATENT COOPERATION TREATY

RECEIVED
23 JAN. 2002

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BIRD, Ariane
BIRD GOEN & CO
Vilvoordsebaan 92
B-3020 Winksele
BELGIQUE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

Date of mailing (day/month/year)	21.01.2002
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Applicant's or agent's file reference N1588-PCT	IMPORTANT NOTIFICATION
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International application No. PCT/IB00/01410	International filing date (day/month/year) 20/09/2000	Priority date (day/month/year) 20/09/1999
---	--	--

Applicant NORTEL MATRA CELLULAR et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
---------------------------------------	--------------------



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PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference N1588-PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IB00/01410	International filing date (day/month/year) 20/09/2000	Priority date (day/month/year) 20/09/1999
International Patent Classification (IPC) or national classification and IPC H04Q7/26		
Applicant NORTEL MATRA CELLULAR et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 9 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 7 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 29/03/2001	Date of completion of this report 21.01.2002
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Ceccarini, G Telephone No. +49 89 2399 2997



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB00/01410

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

1-29 as originally filed

Claims, No.:

1-33 as received on 14/12/2001 with letter of 14/12/2001

Drawings, sheets:

1/17-17/17 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IB00/01410

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
☐ paid additional fees.
☐ paid additional fees under protest.
☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:

- ☐ complied with.
☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☐ all parts.
☒ the parts relating to claims Nos. 1-24,27-30.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 1-24,27-30
	No:	Claims
Inventive step (IS)	Yes:	Claims
	No:	Claims 1-24,27-30

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IB00/01410

Industrial applicability (IA) Yes: Claims 1-24,27-30
 No: Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Concerning Section IV:

- 1 Reference is made to the following document:

D1: EP-A-0 766 427 (NOKIA MOBILE PHONES LTD.) 2 April 1997 (1997-04-02) cited in the application.

It is considered that the present application lacks unity and hence does not comply with the requirements of unity of invention as set forth in Rule 13 PCT. Indeed, it is considered that three separate inventions are claimed in the present application, without there being any unifying inventive concept common to both:

- a. Claims 1 to 24, 27 to 30 relate to a mobile radio network (and methods thereof) which comprises radio heads and a concentrator connected to the radio heads by a local shared resource network.
 - b. Claims 25 and 26 relate to a concentrator for connection to a mobile network being used as a resource on a local shared resource network.
 - c. Claims 31 to 33 relate to a radio head for use as a shared resource on a local shared resource network.
- 3 They are not so linked as to form a single general inventive concept (Rule 13.1).
- Indeed, since the only technical relationship among the claimed inventions is the use of a local shared resource network, which is already known from D1 (see Abstract; Fig.2), the three sets of claims do not have a general inventive concept (Rule 13.2 PCT) and, thus the application lacks unity.
- 4 As a full preliminary search report has been established with respect to all claims on file a full preliminary examination could also be conducted, providing that additional preliminary examination fees were paid, Article 34(3)(a), Rule 68(2) PCT).

- 5 Since neither restriction of the claims has been done, nor additional preliminary examination fees has been paid, preliminary examination has been carried out on the basis of those parts of the application which relate to what appears to be the main invention, namely the invention as defined in present **Claims 1-24, 27-30**.

Concerning Section V:

- 1 Document **D1** (see in particular Abstract; Fig. 2; pag. 9, lines 27-33) discloses, according to features of **Claim 1**, a first local mobile radio telecommunications network (LAN in Fig. 2; page 5, lines 10 to 15) which is connectable to and compatible with a second mobile radio telecommunications network (pag. 3, lines 40-46; Abstract; Fig. 2; cellular radio system pag. 4, lines 32-36), the first local network comprising:
- a first and a second radio head for radio communication with one or more user terminals compatible with the second mobile radio telecommunications network (BU 4 in Fig. 2; pag. 5, lines 23-28; the base units are provided with a limited number of functions pag. 5, lines 16-22);
 - a gateway connected to the radio heads by a local shared resource network (Gateway 1 e LAN in Fig. 2; pag. 6, lines 37-39) the radio heads being shared resources of the gateway (Fig. 2; pag. 5, lines 29- 33).

The subject-matter of Claim 1 differs from that disclosed in D1 only in that the a gateway is used instead of a concentrator and that the synchronization and frequency of a local timing signal of each of the first and second radio heads are being controlled individually and remotely.

However, the gateway in D1 is used with same functions of the concentrator (see for instance D1 pag. 3, lines 30-46; pag.3 line 58 to pag. 4 line 1; pag. 6, lines 22-28) and the timing control represents standard practice for a person skilled in the art LAN synchronization, GSM specification and BTS' clock (see "The GSM system for mobile communications", by M. Mouly and M-B Pautet, Cell & Cys, 1992, pagg. 620-623, as acknowledged by the applicant on page 2).

The subject-matter of Claim 1 does therefore not involve an inventive step (Article 33(3) PCT).

- 2 The subject-matter of independent **Claim 4** differs from that disclosed in Claim 1 only in that a plurality of radio heads are being used and the concentrator includes at least a digital signal processing unit (DSP).

However, D1 also encompasses the use of more than one radio heads (base units pag. 5, line 10) and the use of DSP is a standard practice for elaborating signal in that kind of network.

The subject-matter of Claim 4 does therefore not involve an inventive step (Article 33(3) PCT).

- 3 Independent **Claims 14, 16** contain only features already set out in Claims 1 and 3 respectively, in terms of a method claims.

The subject-matter of Claims 14 and 16 does therefore not involve an inventive step (Article 33(3) PCT).

- 4 The subject-matter of independent **Claim 27** differs from that disclosed in Claim 1 only in that a scanning unit is used in order to scan transmissions from sources of radio energy, the scanning unit being a shared resource on the local shared resource network.

However, it is already disclosed in D1 that the RF part of the base head (base unit 4 in Fig. 4 which belongs to the common LAN resource) is used for measuring radio signals (pag. 7, lines 20-24; for complying with different load requirements pag.7, lines 18-20) and therefore these features are simple modification directly derivable from D1 and thus fall within the normal design choice for a person skilled in the art.

The subject-matter of independent **Claim 28** differs from that disclosed in Claim 1 only in that the first network is adapted to select the signals from one of the radio heads.

However, this is a simple variation of the arrangement disclosed and in the fields of LAN and shared resources (see also D1, page 8; lines 52-57) falls within the general design competence of a skilled person.

The same applies also to independent **Claim 30** where the selection is being made by the concentrator (see also D1, pag. 6, lines 37-39; pag. 3, line 57 to pag. 4, line 1; page 8; lines 52-57).

The subject-matter of Claims 27, 28 and 30 does therefore not involve an inventive step (Article 33(3) PCT).

- 5 The features defined in dependent **Claims 2, 3, 5 to 13, 15, 17 to 24, 29** do not add anything of inventive significance to the claims they refer because they relate to minor constructional circuit details and are either directly derivable from the above-mentioned prior art documents D1, or represents standard practice.

Concerning Section VII:

- 1 Reference signs in parentheses should have been inserted in the claims to increase their intelligibility, Rule 6.2(b) PCT. This applies to both the preamble and characterising portion.
- 2 To meet the requirements of Rule 6.3(b) PCT any independent claim should have been properly cast in the two-part form, with those features which in combination are part of the nearest prior art document D1 being placed in the preamble.

Concerning Section VIII:

- 1 Some of the features in the method Claim 14 relate to an apparatus ("a concentrator ...") rather than clearly defining the method in terms of technical steps. The intended limitations are therefore not clear from this claim, contrary to the requirements of Article 6 PCT.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IB00/01410

- 2 The various definitions of the invention given in independent apparatus Claims 1, 4 and 27, 28 and 30 and method Claims 14 and 16 of overlapping scope are such that the claims as a whole are not concise, contrary to Article 6 PCT. The claims should have been recast to include only the minimum necessary number of independent claims in any one category, with dependent claims as appropriate (Rule 6.4 PCT).
- 3 The general statement in the description at page 29, line 26, is not clear, and when used to interpret the claims renders them also unclear, contrary to Article 6 PCT. The term "and the spirit" should therefore be deleted.

10/088753

JC13 PCT/PTO 20 MAR 2002

1

Claims

1. A first local mobile radio telecommunications network which is connectable to and compatible with a second mobile radio telecommunications network, the first local network comprising: a first and a second radio head for radio communication with one or more user terminals compatible with the second mobile radio telecommunications network; a concentrator connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator; the synchronization and frequency of a local timing signal of each of the first and second radio heads being controlled individually and remotely.
2. The first local mobile radio telecommunications network according to claim 1, wherein the concentrator performs the remote control.
3. The first local mobile radio telecommunications network according to claim 1 or 2, wherein the first and second radio head and the concentrator form one base station.
4. A first local mobile radio telecommunications network which is connectable to and compatible with a second mobile radio telecommunications network, the first local network comprising:
a plurality of radio heads for radio communication with one or more user terminals compatible with the second mobile telecommunications network;
a concentrator connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator; and the concentrator including at least a digital signal processing unit, the digital signal processing unit being a shared resource for the radio heads.
5. The first local mobile radio telecommunications network according to claim 4 or 5 wherein, the concentrator includes at least one of:
a channel coder for channel coding messages to be transmitted from one or more of the radio heads, the channel coder being a shared resource for the one or more radio heads;
a channel decoder, the channel decoder being a shared resource for the one or more

radio heads;

an equalizer, the equalizer being a shared resource for the one or more radio heads;

a demodulator for demodulating radio samples from the one or more radio heads,
the demodulator being a shared resource for the one or more radio heads,

5 a modulator, the modulator being a shared resource for the one or more radio heads;

a digital filter, the digital filter being a shared resource for the one or more radio
heads;

an encrypter, the encrypter being a shared resource for the one or more radio heads;

a decrypter, the decrypter being a shared resource for the one or more radio heads.

10

6. The first local mobile radio telecommunications network according to any of claims 1 to
5, further comprising a scanning unit to scan transmissions from sources of radio energy,
the scanning unit being a shared resource on the local shared resource network.

15 7. The first local mobile radio telecommunications network according to any of claims 1 to
6, wherein each of one or more of the radio heads includes at least two fixed gain receiver
amplifiers and a unit for selecting the output of one of the amplifiers.

8. The first local mobile radio telecommunications network according to claim 6, wherein
20 the selection unit is adapted to select none of the outputs of the amplifiers of one of the one
or more radio heads.

9. The first local mobile radio telecommunications network according to any of claims 3 to
8, wherein each of one or more of the radio heads include at least two receivers and each
25 one or more radio head is adapted to transmit the two received radio signals from the two
receivers to the concentrator via the local shared resource network and the concentrator
includes a selector circuit to select one of the two signals for digital signal processing.

10. The first local mobile radio telecommunications network according to any of claims 3
30 to 9, wherein two or more radio heads are adapted to receive signals transmitted from a
user terminal and the concentrator is adapted to combine the signals from the two or more
radio heads before digital signal processing the combined signals.

11. The first local mobile radio telecommunications network according to any of claims 3 to 9, wherein two or more radio heads are adapted to receive signals transmitted from a user terminal and to transmit these to the concentrator via the local shared resource network and the concentrator is adapted to select the signals from one of the radio heads.

12. The first local mobile radio telecommunications network according to claim 11, wherein the first network is adapted to prevent the received signals of the not-selected radio heads from being transmitted through the local shared resource network.

13. The first local mobile radio telecommunications network according to any of claims 1 to 12, the first network being adapted to transmit a beacon signal from two or more radio heads, each signal being transmitted with a selectable delay.

14. A method of operating a first local radio telecommunications network which is connected to and compatible with a second mobile radio telecommunications network, comprising the steps of: transmitting radio signals from a first and a second radio head to one or more user terminals compatible with the second mobile radio telecommunications network, a concentrator being connected to the local shared resource network, the concentrator and the radio heads being shared resources of a local shared resources network; and remotely controlling the frequency and synchronization of a local timing signal of each of the first and second radio heads individually.

15. The method according to claim 14 wherein the remote control step is performed by the concentrator.

16. A method of operating a first local mobile radio telecommunications network which is connected to and compatible with a second mobile radio telecommunications network, comprising the steps of:
receiving first mobile radio telecommunication signals from one or more user terminals compatible with the second mobile radio telecommunications network at one or more radio heads, the first radio mobile radio telecommunication signals encoding user messages;

transmitting second radio signals derived from the first radio mobile telecommunication signals over a local shared resource network to a concentrator; and digital signal processing the second radio signals in the concentrator.

- 5 17. The method according to claim 15 or 16, further comprising at least one of the following steps in the concentrator:
demodulating radio samples received from the one or more radio heads;
modulating radio samples to be transmitted to one or more radio heads;
channel decoding of radio samples received from the one or more radio heads;
10 channel coding of messages to be transmitted from one or more of the radio heads;
filtering of digital signals to or from the one or more radio heads;
encryption or decryption of digital signals to or from the one or more radio heads;
channel equalization of digital signal to or from the one or more radio heads.
- 15 18. The method according to any of the claims 14 to 17, further comprising the step of scanning transmissions from sources of radio energy.
19. The method according to any of claims 14 to 18, wherein each of one or more of the radio heads includes at least two fixed gain receiver amplifiers, further comprising the step
20 of selecting the output from one the amplifiers.
20. The method according to claim 19, further comprising the step of preventing any of the outputs from the amplifiers of a radio head being transmitted over the local shared resource network.
- 25 21. The method according to any of claims 14 to 19, wherein two or more radio heads are adapted to receive signals transmitted from a user terminal, further comprising the step of combining the signals from the two or more radio heads before digital signal processing the combined signals.
- 30 22. The method according to any of claims 15 to 21, wherein two or more radio heads are adapted to receive signals transmitted from a user terminal, further comprising the steps of:

transmitting the received signals over the local shared resource network to the concentrator and selecting the signals from one of the radio heads in the concentrator for digital signal processing.

5 23. The method according to claim 22, further comprising the step of preventing the received signals of the not-selected radio head from being transmitted through the local shared resource network.

24. The method according to any of claims 14 to 23, further comprising the steps of
10 transmitting a beacon signal from two or more radio heads, each signal being transmitted with a selectable delay.

25. A concentrator for connection on one side to a mobile radio telecommunications network and for connection on another side for use as a shared resource on a local shared
15 resource network having a plurality of radio heads as shared network components; the concentrator comprising: an interface to the local shared resource network; and the concentrator being adapted to control remotely and for each individual radio head both synchronization and frequency of a local timing signal required for the operation of the radio heads.

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26. A concentrator for connection on one side to a mobile radio telecommunications network and for connection on another side for use as a shared resource on a local shared resource network; the concentrator comprising:

an interface to the local shared resource network;

25 digital signal processing units for processing for transmitting outgoing radio signals to the interface for transmission to a radio transmitter the digital signal processing units being shared resources of the local shared resource network.

27. A first local radio telecommunications network which is connectable to and compatible
30 with a second mobile radio telecommunications network, the first local network comprising: a plurality of radio heads for radio communication with one or more user terminals compatible with the second mobile radio telecommunications network; a

concentrator connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator; and a scanning unit to scan transmissions from sources of radio energy, the scanning unit being a shared resource on the local shared resource network.

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28. A first local mobile radio telecommunications network which is connectable to and compatible with a second mobile radio telecommunications network, the first local network comprising: a plurality of radio heads for radio communication with two or more user terminals compatible with the second mobile radio telecommunications network;

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a concentrator connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator; the two or more radio heads being adapted to receive signals from a user terminal and the first network is adapted to select the signals from one of the radio heads for transmission over the local shared resource network.

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29. The first local network according to claim 28, wherein each of the radio heads includes at least two fixed gain receiver amplifiers and a unit for selecting the output of one of the amplifiers or none of the outputs of the amplifiers.

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30. A first local mobile radio telecommunications network which is connectable to and compatible with a second mobile radio telecommunications network, the first local network comprising: a plurality of radio heads for radio communication with a user terminal compatible with the second mobile radio telecommunications network and for transmitting a plurality of radio signals received each received from the same user terminal to the concentrator, the concentrator being connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator, and the concentrator being adapted to select one or a limited number of the radio signals from the plurality of radio signals from one user terminal for digital signal processing.

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31. A radio head for connection on one side for use as a shared resource on a local shared resource network and on another side for communicating with user terminals of a mobile radio telecommunications network via an air interface; the radio head comprising: a

network interface to the local shared resource network; and a unit for transmitting to the network interface non-demodulated radio signals received from the user terminals.

- 5 32. A radio head for connection on one side for use as a shared resource on a local shared resource network and on another side for communicating with user terminals of a mobile radio telecommunications network via an air interface; the radio head comprising:
a network interface to the local shared resource network; and
a first unit for receiving channel coded radio signals from the network interface; and
a second unit for modulating the received channel coded signals.

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33. A radio head for connection on one side for use as a shared resource on a local shared resource network and on another side for communicating with user terminals of a radio telecommunications network via an air interface; the radio head comprising: an interface to the local shared resource network; a synchronizing unit for receiving signals from the local
15 shared resource network for remote control of the synchronization and frequency of a local timing signal required for the operation of the radio head.